

PCT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

**NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT**

(PCT Administrative Instructions, Section 411)

To:

GIAVARINI, Francesco
ABB Ricerca S.p.A.
Viale Edison, 50
I-20099 Sesto San Giovanni
ITALIE

Date of mailing (day/month/year) 06 November 2000 (06.11.00)			
Applicant's or agent's file reference I 0112-PCT	IMPORTANT NOTIFICATION		
International application No. PCT/EP00/05941	International filing date (day/month/year) 20 June 2000 (20.06.00)		
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 14 July 1999 (14.07.99)		
Applicant ABB RESEARCH LTD et al			
<p>1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).</p> <p>2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.</p> <p>3. An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.</p> <p>4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.</p>			
<u>Priority date</u> 14 July 1999 (14.07.99)	<u>Priority application No.</u> EP/99202306.9	<u>Country or regional Office or PCT receiving Office</u> EP	<u>Date of receipt of priority document</u> 24 Octo 2000 (24.10.00)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer Carlos Naranjo Telephone No. (41-22) 338.83.38
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15/11

PENT COOPERATION TREA

PCT

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

GIAVARINI, Francesco
ABB Ricerca S.p.A.
Viale Edison, 50
I-20099 Sesto San Giovanni
ITALIE

Date of mailing (day/month/year) 25 January 2001 (25.01.01)	
Applicant's or agent's file reference I 0112-PCT	
International application No. PCT/EP00/05941	International filing date (day/month/year) 20 June 2000 (20.06.00)
Priority date (day/month/year) 14 July 1999 (14.07.99)	
Applicant ABB RESEARCH LTD et al	

IMPORTANT NOTICE

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AU,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AP,BA,BG,BR,CA,CN,CU,CZ,EA,EE,HR,HU,ID,IL,IN,JP,KE,LT,LV,MK,MX,NO,NZ,OA,PL,RO,SG,
SI,SK,TR,UA,YU

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
25 January 2001 (25.01.01) under No. WO 01/06528

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer J. Zahra Telephone No. (41-22) 338.83.38
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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

GIAVARINI, Francesco
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ITALIE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing (day/month/year)	05.06.2001
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Applicant's or agent's file reference I 0112-PCT	IMPORTANT NOTIFICATION	
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International application No. PCT/EP00/05941	International filing date (day/month/year) 20/06/2000	Priority date (day/month/year) 14/07/1999
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Applicant ABB RESEARCH LTD et al

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

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Authorized officer

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference I 0112-PCT	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP00/05941	International filing date (day/month/year) 20/06/2000	Priority date (day/month/year) 14/07/1999	
International Patent Classification (IPC) or national classification and IPC H01H11/00			
<p>Applicant ABB RESEARCH LTD et al</p>			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 3 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input checked="" type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application 			

Date of submission of the demand 01/02/2001	Date of completion of this report 05.06.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Müller, A Telephone No. +49 89 2399 2425



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/05941

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):
Description, pages:

1-11 as originally filed

Claims, No.:

1-11 as received on 14/05/2001 with letter of 11/05/2001

Drawings, sheets:

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/0594

the drawings, sheets:

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)): *(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1 - 11
	No: Claims
Inventive step (IS)	Yes: Claims
	No: Claims 1 - 11
Industrial applicability (IA)	Yes: Claims 1 - 11
	No: Claims

**2. Citations and explanations
see separate sheet**

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/05941

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The present application does not meet the requirements of Article 33 PCT, because the subject-matter of the claims does not involve an inventive step.

From the document WO-A-9636982 (D1) (see in particular abstract) the following is known in combination:

An actuation and control device for opening and/or closing an electric switchgear (4) which is connected to an electrical network (2) and has at least one fixed contact (72) and at least one movable contact (71), comprising actuation means (8) which are operatively connected to the movable contact (71) and supply the energy to perform opening/closing operations, and measuring means (204) for detecting the voltage and/or the current of at least one of the phases of said network, wherein said actuation means comprise a position control (14), which is operatively connected to the movable contact (71), and an electronic control and power supply unit (12) which receives information from said measuring means (204) and, following an operation command, sends to the actuation means electrical signals for driving said actuation means so that the movement of the movable contact (71) is controlled in relation to a predetermined operation time and to said received information.

The subject-matter of claim 1 differs therefrom in that said actuation means comprise a motor instead of a voice coil actuator.

The possibility of using coils or motors for actuating switchgears is generally known and for example from US-A-4423336 (D2) (see reference M1), wherein the substitution of a motor by a voice coil does not involve a surprising effect for the skilled man.

Therefore starting from what is known from D1 the skilled man would include the general knowledge or what is known from D2 to achieve the subject-matter of claim 1 in an obvious way.

The attention of the applicant is drawn to the fact, that the definition in claim 1 that the actuation means are operatively connected to the movable contact does not lead to the fact, that the actuator directly drives the contacts.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/05941

Under this definition in claim 1 there is also included the possibility of connection means, as for example known from D2 in which the handles drive a mechanism which operates the movable contact.

In view of D1 and D2, the dependent Claims do not appear to contain any additional features which, in combination with the features of any claim to which they refer, involve an inventive step, because they seem to be slight constructional change which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be contemplated in advance.

Re Item VII

Certain defects in the international application

- 1). The independent claim is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1) being placed in a preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT).
- 2). Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 and D2 is not mentioned in the description, nor is this document identified therein.
It is not clear from the description, that D1 forms the base for the pre-characterising part of the claims.

CLAIMS

1. An actuation and control device for opening and/or closing an electric switchgear (4) which is connected to an electrical network (30) and has at least one fixed contact (8) and at least one movable contact (3), comprising actuation means which are operatively connected to the movable contact (3) and supply the energy to perform opening/closing operations, and measuring means (31) for detecting the voltage and/or the current of at least one of the phases of said network (30), characterized in that said actuation means comprise a motor with position control (2), which is operatively connected to the movable contact (3), and an electronic control and power supply unit (100) which receives information from said measuring means (31) and, following an operation command (1), sends to the motor (2) electrical signals for driving said motor (2) so that the movement of the movable contact (3) is controlled in relation to a predetermined operation time and to said received information.
2. An actuation and control device according to claim 1 characterized in that the opening and/or closing is synchronized with respect to at least one of the phases of the electrical network (30).
3. An actuation and control device according to one or more of the previous claims, characterized in that position control is performed by a position sensor on the motor (2).
4. An actuation and control device according to one or more of the previous claims, characterized in that said motor with position control (2) is a rotary servomotor.
5. An actuation and control device according to one or more of the previous claims, characterized by the fact that said electronic control and power supply unit (100) comprises:
 - calculating means (11) suitable for predicting the zeros and maximums of the voltage and of the current of the phases subsequent to those detected by

said measuring means (31) and for calculating the period of time between the zeros and maximums detected and those predicted.

6. An actuation and control device according to claim 5 characterised by the fact that said electronic control and power supply unit (100) comprises table means (34) containing predetermined information regarding the type of load and the load and network neutral connection to ground, said table means (34) being able to output a signal (35) indicating the ideal end-of-operation times in relation to said predetermined information.
7. An actuation and control device according to claim 6 characterized by the fact that said electronic control and power supply unit (100) comprises a timer and command unit (36) that receives in input:
 - an operation command (1) that is asynchronous in relation to the electrical network (30);
 - the signal indicating the ideal end-of-operation times (35);
 - the signal indicating the subsequent predicted zeros or maximums (38);and outputs a corresponding synchronous operating command (37) that is delayed in relation to said asynchronous operating command (1) by a period of time (50) that is a function of the predetermined operation time (51) and of said signals (35, 38) indicating the ideal end-of-operation times and the predicted subsequent zeros or maximums.
8. A pole of a high-voltage circuit breaker, characterized in that it comprises an actuation and control device (200) according to one or more of claims 1 to 7.
9. A three-pole high-voltage circuit breaker for opening and closing a circuit connected thereto, characterized in that it comprises, for each pole, an actuation and control device (200) according to one or more of claims 1 to 7.
10. A three-pole high-voltage circuit breaker for opening and closing a circuit connected thereto, characterized in that it comprises an actuation and control device (200) according to one or more of claims 1 to 7 and a mechanism (24) for coupling said device (200) to each individual pole of the circuit breaker.

11. A high or medium voltage disconnector characterized in that it comprises an actuation and control device (200) according to one or more of claims 1 to 7.

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference I 0112-PCT	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 00/05941	International filing date (day/month/year) 20/06/2000	(Earliest) Priority Date (day/month/year) 14/07/1999
Applicant ABB RESEARCH LTD		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
 - contained in the international application in written form.
 - filed together with the international application in computer readable form.
 - furnished subsequently to this Authority in written form.
 - furnished subsequently to this Authority in computer readable form.
 - the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 - the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. Certain claims were found unsearchable (See Box I).

3. Unity of Invention is lacking (see Box II).

4. With regard to the title,

- the text is approved as submitted by the applicant.
- the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- the text is approved as submitted by the applicant.
- the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

- as suggested by the applicant.
- because the applicant failed to suggest a figure.
- because this figure better characterizes the invention.

None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

P 00/05941

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01H11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 95 28025 A (ABB POWER T & D CO) 19 October 1995 (1995-10-19) the whole document ---	1-10
A	WO 96 36982 A (MCCORMICK GARRETT P ;COOPER IND INC (US); DUNK MICHAEL P (US)) 21 November 1996 (1996-11-21) the whole document ---	1-10
A	DE 38 22 342 A (MITSUBISHI ELECTRIC CORP) 19 January 1989 (1989-01-19) abstract; claims; figures ---	1-10
A	DE 44 40 423 A (SIEMENS AG) 9 May 1996 (1996-05-09) abstract; claims ---	1 -/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

15 November 2000

Date of mailing of the international search report

21/11/2000

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/05941

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 423 336 A (IVERSON JAMES R ET AL) 27 December 1983 (1983-12-27) abstract; claims; figures ---	1-10
A	WO 93 06612 A (SIEMENS AG) 1 April 1993 (1993-04-01) -----	

INTERNATIONAL SEARCH REPORT

Info on patent family members

International Application No

PCT/EP 00/05941

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 9528025	A	19-10-1995	US	5629869 A	13-05-1997
			US	5636134 A	03-06-1997
			US	5638296 A	10-06-1997
WO 9636982	A	21-11-1996	AU	697096 B	24-09-1998
			AU	5752796 A	29-11-1996
			BR	9608875 A	06-07-1999
			CA	2219282 A	21-11-1996
			CN	1190487 A	12-08-1998
			EP	0830699 A	25-03-1998
			JP	11505366 T	18-05-1999
DE 3822342	A	19-01-1989	JP	1187721 A	27-07-1989
			JP	1014835 A	19-01-1989
			JP	1130432 A	23-05-1989
			CH	679619 A	13-03-1992
			US	4945256 A	31-07-1990
DE 4440423	A	09-05-1996	NONE		
US 4423336	A	27-12-1983	CA	1201521 A	04-03-1986
WO 9306612	A	01-04-1993	DE	4131828 C	08-04-1993
			AT	124566 T	15-07-1995
			DE	59202756 D	03-08-1995
			DK	604470 T	13-11-1995
			EP	0604470 A	06-07-1994
			JP	6510853 T	01-12-1994
			US	5530299 A	25-06-1996